WHAT IS CLAIMED IS

1. A multi-carrier CDMA radio transmitting method replicating each information symbol, disposing thus-obtained information symbols along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along a frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising the step of

enabling a transmission rate of the information to be changed by controlling the amount of information transmitted simultaneously by controlling the number of the information symbols to be used in the spreading into the plurality of sub-carrier components for each user to which the information is to be transmitted.

2. The method as claimed in claim 2, wherein codes which are orthogonal with each other are used as the spreading codes used in the spreading of the information symbols for respective users.

3. The method as claimed in claim 1, wherein the number of sub-carriers assigned for the spreading of

all the information symbols to be transmitted simultaneously is fixed, and the number of sub-carriers assigned for the spreading of each information symbol is controlled.

4. The method as claimed in claim 3, wherein the number of information symbols to be used in the spreading into the plurality of sub-carrier components is in inverse proportion to the number of sub-carriers assigned for the spreading of each information symbol.

5. The method as claimed in claim 1, wherein the number of sub-carriers assigned for the spreading of each information symbol is fixed, and, according to the number of information symbols to be used in the spreading into the plurality of sub-carrier components, the number of sub-carriers assigned for the overall spreading of the number of information symbols is controlled.

6. The method as claimed in claim 1, wherein a group of sub-carriers assigned for the spreading of each of all the information symbols to be transmitted simultaneously is made same among the respective information symbols, and the spreading codes used for the

spreading of the respective information symbols are made different.

7. A multi-carrier CDMA radio transmitting method of replicating each information symbol, disposing thus-obtained along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along the frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising the step of

enabling a transmission rate of the information to be changed by controlling multiplex transmission intervals along a time axis for each user to which the information is to be transmitted.

8. A multi-carrier CDMA radio transmitting method of replicating each information symbol, disposing thus-obtained along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along the frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising the step of

enabling a transmission rate of the information to be changed by controlling the number of modulation levels used when the information symbols to be spread are

obtained through data modulation.

9. The method as claimed in claim 1, wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

10. The method as claimed in claim 7, wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

11. The method as claimed in claim 8, wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

12. The method as claimed in claim 1, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between

each adjacent sub-carriers.

13. The method as claimed in claim 7, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between each adjacent sub-carriers.

14. The method as claimed in claim 8, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between each adjacent sub-carriers.

15. The method as claimed in claim 1, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed discretely along the frequency axis.

16. The method as claimed in claim 7, wherein the respective sub-carriers assigned for the spreading of

each information symbol are disposed discretely along the frequency axis.

17. The method as claimed in claim 8, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed discretely along the frequency axis.

18. The method as claimed in claim 1, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed successively along the frequency axis.

19. The method as claimed in claim 7, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed successively along the frequency axis.

20. The method as claimed in claim 8, wherein the respective sub-carriers assigned for spreading each information symbol are disposed continuously along the

frequency axis.

21. A multi-carrier CDMA radio transmitting apparatus replicating each information symbols, disposing thus-obtained along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along the frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising

a transmission-rate control part controlling the amount of information transmitted simultaneously by controlling the number of the information symbols to be used in the spreading into the plurality of sub-carrier components for each user to which the information is to be transmitted.

22. The apparatus as claimed in claim 21, wherein codes which are orthogonal with each other are used as the spreading codes used for the spreading of the information symbols for respective user.

23. The apparatus as claimed in claim 21, wherein said transmission-rate control part comprises a

serial-to-parallel converting part converting series data which is the information to be transmitted to each user into parallel information symbols, and controls the number of the parallel information symbols obtained by said serial-to-parallel converting part.

24. The apparatus as claimed in claim 21, wherein the number of sub-carriers assigned for the overall spreading of the information symbols, the number of which is controlled by said transmission-rate control part, is fixed, and the number of sub-carriers assigned for the spreading of each information symbol is controlled.

25. The apparatus as claimed in claim 24, wherein the number of information symbols controlled by said transmission-rate control part is in inverse proportion to the number of sub-carriers assigned for the spreading of each information symbol.

26. The apparatus as claimed in claim 21, wherein the number of sub-carriers assigned for the spreading of each information symbol is fixed, and, according to the number of information symbols controlled by said transmission-rate control part, the number of sub-

carriers assigned for the overall spreading of the number of information symbols is controlled.

27. The apparatus as claimed in claim 21, wherein a group of sub-carriers assigned for the spreading of each of all the information symbols, the number of which is controlled by said transmission-rate control part, is made same among the respective information symbols, and the spreading codes used for the respective information symbols are made different.

28. A multi-carrier CDMA radio transmitting apparatus replicating each information symbols, disposing thus-obtained along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along the frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising

an intermittent transmission control part controlling multiplex transmission intervals along a time axis for each user to which the information is to be transmitted.

29. A multi-carrier CDMA radio transmitting apparatus replicating each information symbols, disposing thus-obtained along a frequency axis, multiplying the thus-obtained information symbols by a spreading code along the frequency axis, thus spreading the information symbols into components of a plurality of sub-carriers having different frequencies, and thus rendering multiplex transmission of the information, comprising

a modulation level number control part controlling the number of modulation levels used when the information symbols to be spread are obtained through data modulation.

30. The apparatus as claimed in claim 21, wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

31. The apparatus as claimed in claim 28, wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

32. The apparatus as claimed in claim 29,

wherein the respective sub-carriers assigned for the spreading of the information symbols are orthogonal along the frequency axis.

33. The apparatus as claimed in claim 21, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between each adjacent sub-carriers.

34. The apparatus as claimed in claim 28, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between each adjacent sub-carriers.

35. The apparatus as claimed in claim 29, wherein the respective sub-carriers assigned for the spreading of the information symbols have frequency characteristics such that the frequency spectra do not overlap between each adjacent sub-carriers.

36. The apparatus as claimed in claim 21, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed discretely along the frequency axis.

37. The apparatus as claimed in claim 28, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed discretely along the frequency axis.

38. The apparatus as claimed in claim 29, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed discretely along the frequency axis.

39. The apparatus as claimed in claim 21, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed successively along the frequency axis.

40. The apparatus as claimed in claim 28,

wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed successively along the frequency axis.

41. The apparatus as claimed in claim 29, wherein the respective sub-carriers assigned for the spreading of each information symbol are disposed successively along the frequency axis.

42. A channel estimation method used for a multi-carrier CDMA radio transmitting system rendering radio transmission using n sub-carriers, for rendering channel estimation for each sub-carrier, comprising the steps of:

a) separating a received signal having a frame configuration comprising the n sub-carrier components including m sub-carrier components into which pilot symbols are inserted, into the respective sub-carrier components, where $m \leq n$;

b) using the pilot symbols included in the sub-carrier components obtained through the separation, and rendering channel estimation so as to obtain individual channel estimation results for the sub-carriers; and

c) rendering the channel estimation for each target sub-carrier based on the thus-obtained individual channel estimation results for the respective p sub-carriers and relationship between a channel state for the

target sub-carrier and a channel state for each of the p sub-carriers, where $p \leq m$.

43. The method as claimed in claim 42, wherein the relationship between the channel state for the target sub-carrier and the channel state for each of the p sub-carriers is obtained adaptively based on the respective channel states.

44. The method as claimed in claim 42, wherein:

weighting information is obtained based on the relationship between the channel state for the target sub-carrier and the channel state for each of the p sub-carriers; and

the individual channel estimation results for the respective p sub-carriers are weighted by the weighting information and are then combined so as to obtain the channel estimation result for the target sub-carrier.

45. The method as claimed in claim 44, wherein the weighting information is obtained based on mutual correlation obtained based on the individual channel estimation result obtained for the target sub-carrier and

the individual channel estimation result obtained for each of the p sub-carriers.

46. A channel estimation apparatus used for a multi-carrier CDMA radio transmitting system rendering radio transmission using n sub-carriers, for rendering channel estimation for each sub-carrier, comprising:

a sub-carrier separating part separating a received signal having a frame configuration comprising the n sub-carrier components including m sub-carrier components into which pilot symbols are inserted, into the respective sub-carrier components, where $m \leq n$;

an individual channel estimation part using the pilot symbols included in the sub-carrier components obtained by the sub-carrier separating part, and rendering channel estimation so as to obtain individual channel estimation results for the sub-carriers; and

a channel estimation part rendering the channel estimation for the target sub-carrier based on the thus-obtained individual channel estimation results for the respective p sub-carriers and relationship between a channel state for the target sub-carrier and a channel state for each of the p sub-carriers, where $p \leq m$.

47. The apparatus as claimed in claim 46, wherein said channel estimation part comprises a part adaptively obtaining the relationship between the channel

state for the target sub-carrier and the channel state for each of the p sub-carriers based on the respective channel states.

48. The apparatus as claimed in claim 46, wherein said channel estimation part comprises:

a weighting information estimation part obtaining weighting information based on the relationship between the channel state for the target sub-carrier and the channel state for each of the p sub-carriers; and

a weighting channel estimation part obtaining the channel estimation result for the target sub-carrier by weighting the individual channel estimation results for the respective p sub-carriers by the weighting information and then combining them.

49. The apparatus as claimed in claim 48, wherein:

said weighting information estimation part comprises a correlation measuring part obtaining a mutual correlation value based on the individual channel estimation result obtained for the target sub-carrier and the individual channel estimation result obtained for each of the p sub-carriers; and

obtains the weighting information based on the mutual correlation value obtained by said correlation measuring part.